NOTE X.

ON COPHIAS WAGLERI, BOIE
AND
COLUBER SUMATRANUS, RAFFLES.

BY

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(Plate 2, fig. 6).

Günther gives in his »Reptiles of India" the following synonymy of *Trimeresurus Wagleri:*

Trigonocephalus Wagleri, Schlegel, Phys. Serp. II. p. 542.

Trimesurus maculatus, Gray, Zool. Misc. p. 48, and Viper. Snakes, p. 8. — (This *Tr. maculatus* is composed of young specimens of *Tr. Wagleri*, Schleg., and of *Tr. formosus*, Gray; I consider the latter as a Bornean variety of *Tr. Wagleri*, and different from the *Tr. formosus* of Müller and Schlegel).

Trigonocephalus sumatranus, Cantor, Mal. Rept. p. 121 — (not *Coluber sumatranus*, Raffles, a snake said to have 184 ventral shields).

Trimesurus sumatranus, Gray, Viper. Snakes, p. 10.

Trimesurus subannulatus, Gray, Viper. Snakes, p. 9; Motley & Dillwyn, Nat. Hist. Labuan, p. 44 (var.).

Trimesurus formosus, Gray, Viper. Snakes, p. 10.

To this list of synonymes I may add:

Tropidolaemus Schlegeli, Bleeker (as already suggested by Günther, who mentions in a note, that the British Museum received from Dr. Bleeker's collection a *Tr. Wagleri* of a uniform greenish color under the name of *Tropidolaemus Schlegeli*) [1], and

Tropidolaemus formosus Bleeker. [2])

These two new species, created by Dr. Bleeker and mentioned as such in several lists of the fauna of the Malayan islands, were never described by the author himself, who referred as to the description, to his great work on East-Indian Reptiles to be published afterwards. This work having never appeared, and the typical specimens, both of *Tr. Schlegeli* and *Tr. formosus*, being in the possession of the Leyden Museum, I intended to give their description after a careful examination of the typical specimens. I therefore compared them with the specimens of *Bothrops Wagleri* in our collection, and though the result of this examination is a negative one as to the identity of the new species, I found so great a difference between the various specimens of *B. Wagleri* (28 in number), that I suppose it will not be without advantage for science, when I give here the description of some of the various forms of *B. Wagleri* of different ages, found in different parts of the Malayan Archipelago.

The most common coloration of the specimens in our collection is that already described by Günther l. c. as the coloration of the halfgrown- and the adult state.

The color of the body is black and yellow or greenish-yellow, with a great number of yellow cross-bands. The yellow or greenish-yellow scales are all edged with black, with exception of those scales which form the cross-bands. This black on the scales increases with age so that in the largest forms the yellow color is reduced to a round spot on the black scale.

The head is covered with small scales of a black or yellow or greenish-yellow color. The colored scales on the head never have black edges. The canthus rostralis is co-

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1) Günther l. c. p. 388.

2) Bleeker, Natuurk. tijdschr. voor Ned.-Indië. part XV, p. 263; part XIII, p. 475, a. o.

vered with scales of a pure yellow color, stretching from the tip of the snout till behind the angle of the mouth. The labialia are pure yellow, often with narrow black edges. The under surface of the head is covered with yellow or greenish-yellow scales, sometimes edged with black.

The black margins on the scales of the body decrease in passing from the back to the sides, so that the lower surface shows the brightest coloration. The yellow cross-bands, in number from 30—35 on each side of the body, meet each other on the back in the foremost and hindmost part, but are placed alternatively in the middle of the body. They are as large as one scale and reach in some specimens till on the ventralia, forming there a dark yellow spot.

The ventralia are of a greenish-yellow color, sometimes spotted with yellow, sometimes of a pure yellow. Posteriorly they are always edged with black, but this black margin is often interrupted and composed of 2 black lines.

The root of the tail shows on each side about 7 yellow cross-bands placed alternatively; the end of the tail is black.

In the collection of the Leyden Museum there are 9 specimens of *B. Wagleri* showing the foregoing coloration. The largest one attains to a length of 102 c. m. the smallest one only measures 59 c. m. Two of them 80 and 82 c. m. in length were captured in the island of Banka, of the large one the locality is unknown, whilst the rest are originate from the island of Sumatra.

Two of these Sumatran specimens, attaining to a length of only 62 and 73 c. m. contained full-grown embryos.

Between the coloration of these embryos and that of the adult exists a very great difference.

All these young ones are of a nearly uniform green color, with a greenish-yellow ventral side and a reddish tail. The line on the canthus rostralis in these specimens (preserved in spirits) is white with a brownish color beneath the white line (according to Günther the color of this streak in living specimens is cinnamon red with a buff line). On each side of the body there is a series of 30 to

35 streaks, which are half white, half brownish colored. No black, nor yellow, nor black edged scales, so characteristical in the adult ones, are to be seen in these young specimens of *B. Wagleri.*

It is very interesting to remark the difference in the number of scales in a transverse series at the same place of the body in two different embryos of the same mother. Among the 20 embryos of the same mother I found in one specimen the largest number of scales in a transverse series to be 21, in others it was 23, in still others the number attained to 25.

This fact removes Blanford's objection against the identity of *Tr. maculatus* and *B. Wagleri* [1]).

The great difference in coloration between the adult and the young specimens would lead us to expect a great number of intermediate forms; nevertheless these intermediate forms seem to be very rare.

Among all the specimens in the collection of the Leyden Museum there is only one *B. Wagleri*, which shows at the same time traces of the coloration of the young and the adult state. This specimen was captured at Padang and has a length of 53 c.m. The green color is here still prevalent, though the scales of the body are already edged with black, except those which form the cross-bands. These cross-bands are of a somewhat yellowish-green color, and on nearly each of them is a small white spot, which remembers the white markings of the young specimens. The crown of the head is covered with small green scales, some of them edged with black. The line on the sides of the head, chiefly behind the eye, is pure white with a brownish line beneath and a yellowish tinge above. The labialia are green, some of them yellowish-green. The anterior part of the tail has green cross-bands with white spots.

Not all the young *B. Wagleri* get in the adult state the typical coloration described above, many of them showing a similar coloration as the young ones long after having attained to maturity.

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[1]) W. F. Blanford, On reptiles and frogs of Singapore, in Proc. Zool. Soc. 1881, p. 224.

So there are in our collections 2 specimens from Deli, attaining to a length resp. of 35 and 41 c.m., which show exactly the same coloration as the young ones.

The same is the case with 3 specimens of nearly the same length, two from East-Java, one from Borneo.

Another specimen, collected by S. Müller in Borneo, having a length of 36 c.m. shows the coloration of the young ones, except the white spots on the sides, which are transformed in real cross-bands, 32 on each side of the body. These cross-bands are placed alternatively on each side of the body, but the last 5 are so regularly arranged as to flow together on the back. All the cross-bands reach the ventralia and form there laterally placed horse-shoe shaped white spots. Along the white cross-bands spots of a brownish color may be seen. The end of the tail also shows a brownish color.

It is very probable that this brownish color was a red one when the snake was alive.

A similar coloration as the foregoing specimens shows a snake presented to the Leyden Museum by the Museum of Berlin under the name of *Trimesurus subannulatus* Gray. This specimen collected in Luçon has a length of 55 c.m. and only 23 scales in a transverse series on the thickest part of the body. The color is bluish-green on the back, green on the sides, and pale green on the ventralia. The end of the tail is reddish. The white and brownish line on the sides of the head is present. A series of 25 white and brownish spots or streaks on each side of the body. Seven similar small streaks on each side at the root of the tail. The labialia are green, and the ventralia are not terminated by black edgings, but show instead of them some irregular dark green spots.

There can be no doubt that this specimen also belongs to *B. Wagleri.*

The same is the case with a snake from Dr. Bleeker's collection under the name of *Tropidolaemus Schlegeli.* The general color is green with small whitish spots on the sides of the body, and on the root of the tail. The ventralia and the labialia are of a yellowish-green color, the end of the tail is red. The streak on the sides of the head is brownish and broader than in the former specimen.

This snake has a length of 63 c.m., and the greatest number of scales in a transverse series is 24.

Another snake from Dr. Bleeker's collection under the name of *Tropidolaemus formosus*, but in a very bad condition, proves by inspection to be also a variety of *B. Wagleri.* The general color is a pale bluish-green with traces of cross-bands. Probably these cross-bands were of a green color. The end of the tail is reddish. No traces of white spots are to be seen. This specimen, 59 c.m. long, shows no difference with regard to the scales of the body and the head with the typical specimen of *B. Wagleri* and as to the coloration may belong to the blue variety of Padang now to be described.

This variety from Padang, a snake of 84 c.m. with 139 ventralia, 46 anal-shields and 25 rows of scales, differs in coloration from all the specimens till now described. The color is bluish-green and yellow, instead of a yellow and black color as in the adult specimen from Sumatra. The scales on the anterior part of the head are bluish-green with a yellow keel, on the hinder part of the head bluish-green with a yellow spot. The labialia are yellow with a bluish-green margin. These bluish-green and yellow colors are never distinctly limited but always flow together. The yellow spots are never round but always lozenge-shaped. The line or streak on the sides of the head is of a bluish color and only visible behind the eye. The cross-bands, at a distance of 2 or 3 scales from each other, are blue and reach the ventralia where they form oblong dark blue laterally situated spots. The black line on the ventralia of the typical specimens is here represented by a blue colored line. The number of cross-bands on the body is 34 to 35, whilst there are still some similar bands to be observed on the root of the tail. The end of the tail is blackish. The yellow color of the scales shows the highest development on the back; on the sides of the body the scales are almost pure blue, except the last row of scales, which is formed by yellow scales with a blue margin.

The scales of the body are somewhat larger than the scales of the typical specimens of *B. Wagleri* of the same length, and the keels much more developed.

Though this specimen differs in many points from the other specimens of *B. Wagleri*, I do not think it reasonable to base a new species on it, and prefer to regard it as a blue colored variety.

Of another variety 2 specimens of nearly the same length (64 c.m.) and coloration were captured in Celebes. The color of the back is a marine-blue passing into green on the sides, and into yellow on the ventralia. The scales are not provided with black edges but uniformly colored. The head is entirely blue with an indication of a paler line on the canthus rostralis and behind the eye. Along the sides there is a series of cross-bands (25 on the right side) placed alternatively on each side but sometimes flowing together on the back. These cross-bands are formed by a white and a black line running side by side. In most of them the white line is the foremost. The black color of the cross-bands sometimes reaches the ventralia where it forms a black spot. The tail is also provided with black cross-bands, flowing together on the back; in one of these two specimens these cross-bands, 11 in number, are present till the end of the tail, in the other specimen they do not reach so far, and the end of the tail is of a reddish color.

As these two specimens were the only ones we got from Celebes, and were collected at the same place, I cannot make out whether this variety is a common one in that island, or whether it ought to be considered as an exception.

Another snake, somewhat resembling this Celebean variety, was captured in Sumatra by S. Müller. It is a specimen of 62 c.m., which shows the same coloration of the cross-bands, only with the white color somewhat less developed. The color of the back is also blue passing into green and yellow, but the scales are all edged with black. The cross-bands on the tail do not reach the end, which is of a reddish color.

All the here described specimens agree with the typical specimens of *B. Wagleri* in having the second upper labial shield separated from the facial pit, in having strongly keeled scales on the top and the under surface of the head, and having 135—150 ventral shields. The number of scales in a transverse series may vary from 21—25.

They must all be regarded as specimens of *Bothrops Wagleri.*

This is not the case with the *Coluber sumatranus* Raffles.

In the »Description of a Zoological collection made in Sumatra" by Sir Thomas Stamford Raffles [1]) we meet with the description of a pitviper „which has some resemblance with *C. gramineus*, but is larger and much more venomous, being particularly distinguished by having two fangs of extraordinary length."

Sir Raffles proposes the name of *Coluber sumatranus* for this species, which distinguishes itself from the other pitvipers by having 184 ventral and 69 caudal shields. Other characteristicals are: two large plates above each eye, and a general green color, the body being encircled with several irregular black rings and the tail being of a reddish color, whilst each scale of the body is edged with black.

This *Coluber sumatranus* was about 4 or 5 feet in length and rather thick, and had two fangs of about half an inch in length, white and slender and curved backwards.

This specimen probably got lost and the above men-

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1) Transactions of the Linnean Society, XIII, p. 334.

tioned description only, maintained the name of *Coluber sumatranus* in Erpetology.

In the »Essay sur la Physionomie des Serpents'' Schlegel mentions the *C. sumatranus* Raffles and supposes it to be the same as *Tr. Wagleri* [1]).

Duméril and Bibron in their Erpétologie générale also believe *Coluber sumatranus* and *Tr. Wagleri* to be the same species, but their false quotation induces me to suppose they only copied Schlegel in this regard.

Cantor [2]) gives a description of a green pitviper with 141—147 ventral shields and supposes this to be the *C. sumatranus* Raffles as well as the *Cophias Wagleri* Boie..

It was Günther l. c. who first pointed out the great difference in the number of ventral shields in *C. sumatranus* and *B. Wagleri*, but as his remark only is a negative one, we may conclude, that Günther also knew the *C. sumatranus* only by Raffles' description.

In comparing Raffles' description with the description and the plate of *Trigonocephalus formosus* Müll. & Schleg. [3]) as well as with the type, still in the collection of the Leyden Museum, I feel sure that *Trigonocephalus formosus* Müll. & Schleg. is the same species as *Coluber sumatranus* Raffles.

Trigonocephalus formosus Müll. & Schleg. has 187 ventral shields, large supraciliaria and extraordinary long and strongly curved fangs. It is of a green color, with a great number of cross-bands and has a reddish tail, whilst each scale is edged with black.

The number of the ventral shields alone would be a

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1) Erroneously Schlegel quotes the Philosophical Transactions instead of the Transactions of the Linnean Society, but the number of part and page clearly proves Schlegel's acquaintance with Raffles' description.

2) Cantor, Catalogue of Reptiles inhabiting the Malayan Peninsula and Islands.

3) Over de in den Indischen Archipel voorkomende soorten van het slangengeslacht *Trigonocephalus*, door Sam. Müller en Herm. Schlegel, p. 52, in: Verhandelingen over de Nat. Hist. der Nederl. overzeesche bezittingen.

sufficient reason to suppose a great analogy between the two specimens; for none of all the Crotalidae of India, described in Günther's Reptiles, has a number of ventral shields between 180 and 190. The rest of Raffles' description agrees so well with *Tr. formosus*, that there can be not the slightest doubt that Müller and Schlegel's new *Tr. formosus* from W. Sumatra is *Bothrops sumatranus* Raffles.

The type specimen of *Tr. formosus* Müll. & Schleg. in our collection is, up to this time, the only known specimen of *B. sumatranus.*

This *B. sumatranus* is characterized by having about 187 ventral shields, by the want of keels on the scales of the head, which are small except the supraciliaria and the supranasalia with their adjacent scales [1]). The second upper labial shield forms the front part of the facial pit. The general color is green with a great number of black crossbands and a reddish tail. All the scales of the body are edged with black.

It cannot be denied that there exists a great resemblance in coloration between *B. Wagleri* and *B. sumatranus*, but as we have but one specimen of *B. sumatranus* (*Tr. formosus* M. & Schl.) it is impossible to know whether the same variations in coloration exist in this species as they do in the allied *B. Wagleri.* Yet it would not be to be wondered at when there afterwards were found young specimens of *B. sumatranus* of a uniform greenish color, just as the young *B. Wagleri.*

In the collection of the Leyden Museum there are 9 specimens of a pitviper, showing a great analogy in coloration with *B. erythrurus* and *B. gramineus* but differing from these species by having a reddish tail, and by the number of ventral shields.

I supposed them to be specimens of a still undescribed species of pitvipers, and made a description of them un-

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1) See: Jan, Iconogr. génér. d. Ophidiens, livr. 47, pl. 5 fig. 1, where the different parts of *Tr. formosus* (made after the type) are very correctly figured.

der the name of *Bothrops Hageni*, which description I destined for the next number of the Notes from the Leyden Museum.

In comparing afterwards my description of *B. Hageni*, with that of *C. sumatranus* and *Tr. formosus* I was struck by the great analogy in the number of ventral shields, which induced me to believe *B. Hageni* to be identical with *B. sumatranus*.

The description of the specimens is as follows:

They all agree in having large supraciliaria, the rest of the scales of the head small except the 2 large supranasalia and their adjacent scales (Pl. 2, fig. 6). All the scales of the head are flat without the slightest keel. In all of them the second upper labial shield forms the front part of the facial pit. The number of the ventralia varies from 182—191, that of the anal shields from 60—76. There are 21 scales in a transverse series, just as in the *B. sumatranus*.

The general color is a green one with a reddish tail. No scales are edged with black except those of the last series which have a small black spot at the tip and the underside. All have a white line along the ventral shields. This white line results from the scales of the last series which have the upper half white, and the scales of the second series, which have the lower half white. This extraordinary manner in which this line is formed, may also be seen in *B. sumatranus* where the pale yellow colored line along the ventral sides is formed in the same way, and not as is described by Müller & Schlegel only by the second series of scales being of a pale yellow color.

Six of the nine specimens have small white spots along the sides, only two specimens have a distinct pale line along the sides of the head behind the eye. A very small specimen, only measuring 35 c.m., shows no traces of the line along the sides of the head, nor any indication of white spots along the sides; on the contrary the line along the ventral sides is here very distinctly developed, and also the black edgings on the scales of the last series.

Eight of these specimens were captured in Sumatra, one in the island of Banka.

In connection with the green color of the young *B. Wagleri*, I suppose the now described nine green pitvipers to be young specimens of *B. sumatranus*. If later researches might prove this supposition to be false, I propose the name of *Bothrops Hageni* for the green, red-tailed *Bothrops*, with 180—190 ventral shields.

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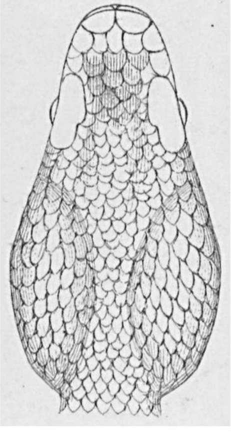

Dr. R. Horst et H. Verlint, ad nat. del.   H. Verlint lith.   P. W. M. Trap impr.

6. BOTHROPS SUMATRANUS *Raffles* (juv.?).